

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-1 Company Name Midland Oil Co. Date Drilled 5/31/1924 Depth 3032 '

Location 300' F N L & 300' F W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	21 '		'	
"	15 1/2 "	908 '		'	
"	8 5/8 "	2335 '		'	
"	7 "	2856 '		'	
"	5 1/2 "	liner	2831' to 3002'	'	

Formations Open To Wellbore: Burbank (open hole 3002' to 3032')

Well Name NBU 23-2 Company Name Midland Oil Co. Date Drilled 5/30/1924 Depth 3121 '

Location 300' F N L & 980' F W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '		'	
"	15 1/2 "	910 '		'	
"	8 5/8 "	2340 '		'	
"	7 "	2875 '		'	
"	5 1/2 "	Liner	fish all liner, dmpd 3 sx cmt @ 2964'.		
"	5 3/16 "	3034 '	Cmt'd w/40 sx reg w/30% Diacel D.	'	

Formations Open To Wellbore: Burbank (Open Hole 3034' to 3121')

Well Name NBU 23-3 Company Name Midland Oil Co. Date Drilled 5/24/1924 Depth 3111 '

Location 300' F N L & 980' F E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Oil Producer

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '		'	
"	8 5/8 "	2378 '		'	
"	7 "	2867 '		'	
"	5 3/16 "	Liner	From 2789' to 3043'	'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: Burbank (Open Hole 3043' to 3111')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION
WELL WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-4 Company Name Midland Oil Co. Date Drilled 5/27/1924 Depth 3050 '

Location 300' F_N L & 300' F_E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '		'	
"	15 1/2 "	918 '		'	
"	12 1/2 "	1245 '		'	
"	8 5/8 "	2330 '		'	
"	7 "	2825 '		'	
"	5 1/2 "	liner '	2800' to 3027'	'	

Formations Open To Wellbore: Burbank (open hole 3027' to 3050')

Well Name NBU 23-5 Company Name Midland Oil Co. Date Drilled 6/7/1924 Depth 3073 '

Location 980' F_N L & 300' F_W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 10/31/62

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	41.5 '		'	CO to 3065'. Spot 35 sx reg w/30% Diacel D & 2% CC @ 3000'. TOC @ 2420'. Part & POOH 5 1/2" @ 2355' & pld 108 jts. Part & POOH 7" @ 2340' & pld 106 jts. Part & POOH 8 5/8" @ 2325' to 1710' & pld 80 jts. Part & POOH 10 3/4" rec 170'. Mudded hole to surf.
"	15 1/2 "	958 '		'	
"	10 "	1666 '		'	
"	8 5/8 "	2355 '		'	
"	7 "	2658 '		'	
"	5 3/16 "	2918 '		'	
"	5 1/2 "	liner '	fshd 111.5' of liner. 68' left in hole. 2 sx cmt @ 2988'.	'	

Formations Open To Wellbore: None

Well Name NBU 23-6 Company Name Midland Oil Co. Date Drilled 5/28/1924 Depth 3084 '

Location 980' F_N L & 980' F_E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 9/3/62

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	21 '		'	Spot 65 sx com w/30% Diacel D & 2% CC @ 3045'. TOC @ 2665'. Part & POOH 7" csg @ 2500' & pld 113 jts. Dmpd 10 sx cmt @ 2500'. Part & POOH 8 5/8" csg @ 1750' & pld 90 jts. Mudded hole to surf
"	10 "	1680 '		'	
"	8 5/8 "	2340 '		'	
"	7 "	2858 '		'	
"	5 1/2 "	liner '	2838' to 3065'	'	
"				'	

Formations Open To Wellbore: None

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-7 Company Name Midland Oil Co. Date Drilled 7/14/1924 Depth 3078 '

Location 980' FN L & 980' FE L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 11/2/62

Elevation 1173 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	38 '			' Spot 60 sx reg w/30% Diacel D & 2% CC @ 3046'. TOC @ 2980'. Part & POOH 7"
"	16 "	968 '			' csg @ 2740' & pld 123 jts. Dmpd 10 sx cmt
"	8 5/8 "	2283 '			' @ 2740'. Part & POOH 8 5/8" @ 2300' &
"	7 "	2887 '			' pld 72 jts. Part & POOH 16" @ 315' & pld
"	5 1/2 "	liner	2862' to 3078'		15 jts. Mudded hole to surf.

Formations Open To Wellbore: None

Well Name NBU 23-8 Company Name Midland Oil Co. Date Drilled 5/27/1924 Depth 3032 '

Location 980' FN L & 300' FW L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 8/10/62

Elevation 1141 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	35 '			' Spot 55 sx reg w/30% Diacel D & 2% CC @ 3025'. TOC @ 2960'. Part & POOH 7"
"	10 "	1475 '			' csg @ 2715'-2390' & plg 110 jts. Dmpd 10
"	8 5/8 "	2346 '			' sx cmt @ 2380'. Part & POOH 8 5/8" csg
"	7 "	2806 '			' 1580-1490' & pld 71 jts. Mudded hole to
"	5 1/2 "	liner	2781' to 3032'		surf.

Formations Open To Wellbore:

None

Well Name NBU 23-9 Company Name Midland Oil Co. Date Drilled 6/5/1924 Depth 3042 '

Location 980' FN L & 300' FE L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation 1133 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	18 '			'
"	15 1/2 "	892 '			'
"	8 5/8 "	2303 '			'
"	7 "	2850 '			'
"	5 1/2 "	liner	2779' to 2975'		'
"					'

Formations Open To Wellbore: Burbank (open hole 3005' to 3042')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-10 Company Name Midland Oil Co. Date Drilled 6/11/1924 Depth 3100 '

Location 910' F S L & 980' F W L, NW /4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	40 '	ran 215.11' 5 1/2" csg @ 3062'. Cmt w/65 sx w/20% Diacel D & 2% CC.	'	
"	15 1/2 "	956 '		'	
"	8 5/8 "	2405 '	fsh 5 1/2" liner, recovered 152', 153' left in hole. Dmpd 2.5 sx cmt @2984'.	'	
"	7 "	2915 '		'	
"	5 1/2 "	liner		'	
"	5 3/16 "	3048 '		'	

Formations Open To Wellbore: Burbank (open hole 3048' to 3100')

Well Name NBU 23-11 Company Name Midland Oil Co. Date Drilled 6/16/1924 Depth 3104 '

Location 980' F S L & 980' F E L, NW /4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation 1206 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	15.5 '	ran 208.06' 5 1/2" csg @ 3074. cmtd w/65 sx w/20% Diacel D & 2% CC.	'	
"	15 1/2 "	976 '		'	
"	8 5/8 "	2401 '		'	
"	7 "	2922 '		'	
"	5 1/2 "	liner	fshd 202' 5 1/2" liner. 2.5 sx cmt @ 2955'	'	

Formations Open To Wellbore: Burbank (open hole 3074' to 3104')

Well Name NBU 23-12 Company Name Midland Oil Co. Date Drilled 6/3/1924 Depth 3157 '

Location 1695' F N L & 300' F E L, NW /4, Sec. 14, T 27 N, R 05 E Status Shut in oil

Elevation 1248 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	39 '	ran 244.46' 5 1/2" csg @ 3112'. Cmt w/65 sx w/20% Diacel D & 2% CC. CO cmt to btm.	'	
"	15 1/2 "	1040 '		'	
"	8 5/8 "	2420 '		'	
"	7 "	2915 '		'	
"	5 1/2 "	liner	fshd all of 5 1/2" liner @ 2965'. 3 sx cmt @ 2955'.	'	

Formations Open To Wellbore: Burbank (open hole 3112' to 3157')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION
WELL WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-13 Company Name Midland Oil Co. Date Drilled 6/13/1924 Depth 3103 '

Location 300' F S L & 300' F E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 2/18/63

Elevation 1306 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	38 '			Co to 3103'. Cmt'd w/80 sx reg w/30% Diacel D @ 2600'. Part & POOH 7" csg @ 2525' & pld 114 jts. Part & POOH 8 5/8" csg @ 2340' & pld 109 jts. Part & POOH 10 3/4" 1452-1310' & pld 60 jts. Part & POOH 16" 800-635' & pld 32 jts. Mudded hole to surf.
"	15 1/2 "	967 '			
"	10 "	1520 '			
"	8 5/8 "	2423 '			
"	7 "	2898 '			
"	5 1/2 "	liner	2873' to 3053'		
"	4 "	325 '			

Formations Open To Wellbore: None

Well Name NBU 23-14 Company Name Midland Oil Co. Date Drilled 6/1/1924 Depth 3142 '

Location 300' F S L & 980' F E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 1/17/63

Elevation 1236 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	43 '			Spot 75 sx common w/30% Diacel D & 2% CC @ 3092'. TOC @ 2850'. Part & POOH 7" @ 2750' & pld 126 jts. Dmp'd 10 sx cmt @ 2650'. Part & POOH 8 5/8" @ 2395' & pld 110 jts. Part & POOH 16" 740-579' & pld 29 jts. Mudded hole to surf.
"	16 "	1003 '			
"	8 5/8 "	2439 '			
"	7 "	2907 '			
"	5 1/2 "	liner	2882' to 3106'		

Formations Open To Wellbore: None

Well Name NBU 23-15 Company Name Midland Oil Co. Date Drilled 5/16/1924 Depth 3104 '

Location 300' F S L & 980' F W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 11/9/62

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '			Spot 35 sx reg w/30% Diacel D @ 3041'. TOC @ 2700'. Part & POOH 7" csg 2720-2665' & pld 121 jts. Part & POOH 8 5/8" csg 2300-1100' & pld 51 jts. Mudded hole to surf
"	16 "	120 '			
"	12 1/2 "	1285 '			
"	10 "	1632 '			
"	8 5/8 "	2371 '			
"	7 "	2830 '			
"	5 1/2 "	liner	2905' to 3146'		

Formations Open To Wellbore: None

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-16 Company Name Midland Oil Co. Date Drilled 7/12/1924 Depth 3015 '

Location 300' F S L & 316' F W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 11/21/62

Elevation 1116 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	78 '	hole filled w/mud to btm of 20" csg, 20" csg POOH, hole filled w/mud fluid.		Part & POOH 5 1/2" csg @ 2700' & pld 121 jts. Part & POOH 7" csg 2650' & pld 120 jts. Dmpd 10 sx cmt @ 2600'. Part & POOH 8 5/8" csg @ 2255' & pld 109 jts. Part & POOH 16" csg 800-500' & pld 26 jts. Mudded hole to surf.
"	16 "	880 '			
"	8 5/8 "	2276 '			
"	7 "	2669 '			
"	5 1/2 "	2860 '			

Formations Open To Wellbore: None

Well Name NBU 23-W21 Company Name Phillips Petroleum Co. Date Drilled 10/8/1962 Depth 3106 '

Location 890' F S L & 565' F W L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Injection well

Elevation 1166 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	113 '	Cmt w/95 sx cmt		
"	4 1/2 "	3066 '	Cmt w/135 sx cmt w/30% Diacel D	1650	
"	"	"			
"	"	"			
"	"	"			

Formations Open To Wellbore: Burbank (open hole 3066' to 3106')

Well Name NBU 23-W23 Company Name Phillips Petroleum Co. Date Drilled 10/13/1962 Depth 3088 '

Location 890' F S L & 715' F E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Injection well

Elevation 1159 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	121 '	Cmt w/105 sx cmt		
"	4 1/2 "	3050 '	Cmt w/135 sx cmt w/30% Diacel D		
"	"	"			
"	"	"			
"	"	"			

Formations Open To Wellbore: Burbank (open hole 3050- 3088)

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-W25 Company Name Phillips Petroleum Co. Date Drilled 12/3/1962 Depth 3151'

Location 370' FN L & 565' FW L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Injection well

Elevation 1212 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8"	122'	Cmt w/105 sx cmt	'	
"	4 1/2"	3106'	Cmt w/135 sx cmt w/30% Diacel D	'	
"	3 1/2"	3098'	Cmt w/75 sx cmt w/2% Gel	'	
"	"	"		'	

Formations Open To Wellbore: Burbank (Open Hole 3106' - 3151')

Well Name NBU 23-W26 Company Name Phillips Petroleum Co. Date Drilled 12/8/1962 Depth 3158'

Location 420' FN L & 1245' FW L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 10/28/1981

Elevation 1226 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8"	122'	110 sx cmt	'	cmtd w/150 sx reg cmt @ 3014'. Part & POOH csg off @ 700'. Filled hole w/mud. Cmtd w/20 sx reg, raise tg to 120' & spot 20 sx cmt, raise to 30' & spot 10 sx cmt. Cmt to surf. Cap w/ steel plate.
"	4 1/2"	3126'	110 sx cmt w/30% Diacel D	'	
"	"	"		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: None

Well Name NBU 23-W27 Company Name Phillips Petroleum Co. Date Drilled 12/14/1962 Depth 3114'

Location 420' FN L & 715' FE L, NW 1/4, Sec. 14, T 27 N, R 05 E Status P & A'd 02/23/2006

Elevation 1154 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8"	118'	105 sx cmt	'	RIH w/tbg to 2067'. Spotted 200 sks Reg cmt. POOH w/same. RIH w/tbg & tag plug @ 2167'. Pumped another 50 sks Reg cmt. POOH w/tbg to 1200'. Pumped mid-plug @ 1200' w/50 sks Reg cmt. POOH w/tbg. Parted 4 1/2" csg @ 536'. POOH w/csg. RIH w/tbg open ended to 540'. Pumped 225 sks Reg cmt to surface. Cutoff 8 5/8" csg 3' below GL. Then restored location.
"	4 1/2"	3059'	110 sx cmt w/30% Diacel D	'	
"	"	"		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: None

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 23-W28 Company Name Phillips Petroleum Co. Date Drilled 12/19/1962 Depth 3051 '

Location 420' F N L & 75' F E L, NW 1/4, Sec. 14, T 27 N, R 05 E Status Injection well

Elevation 1115 ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	8 5/8 "	121 '	Cmt w/105 sx cmt	'	
"	4 1/2 "	3016 '	Cmt w/110 sx cmt w/30% Diacel D	1675 '	
"	"	"		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: Burbank (open hole 3016 to 3051')

Well Name _____ Company Name _____ Date Drilled _____ Depth _____ '

Location _____ ' F _____ L & _____ ' F _____ L, _____ /4, Sec. _____, T _____ N, R _____ E Status _____

Elevation _____ ☐ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	"	"		'	
"	"	"		'	
"	"	"		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: _____

Well Name _____ Company Name _____ Date Drilled _____ Depth _____ '

Location _____ ' F _____ L & _____ ' F _____ L, _____ /4, Sec. _____, T _____ N, R _____ E Status _____

Elevation _____ ☐ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	"	"		'	
"	"	"		'	
"	"	"		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: _____

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Fee Land

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 1A is located 330 Ft. from S line and 330 Ft. from E lineSW/4 Sec 1427N05EOsage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1146 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

- Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings to be used. Indicate proposed mudlogging, cementing & other work.
 Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.
 Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.
 A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs
 To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk from hole if needed. RIH w/bit & scraper to TD. Set CIBP at end of casing or liner. Perf & cement csg or liner to 700' above end. WOC. Shoot off & POOH w/top 500' of csg. (or shoot every 50 ft to surface). Install new 3½" production casing w/bottom 500 ft chrome lined. Cement this to surface w/DV tool set @ 600'. WOC. RIH w/ bit & clean out to CIBP. Run CBL. Will drill CIBP & put on production when needed for CO2 flood. I understand that this plan of work must receive approval in writing of the Osage Indian Agency before operations may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. SpencerTitle: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

- Subsequent Report of: _____
 Conversion..... ☐
 Formation Treatment.. ☐
 Altering casing..... ☐
 Plugging Back..... ☐
 Plugging..... ☐

Details of Work & Results Obtained

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Amnt. Recovered	If Panted Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010.

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Gladys I. McComb

May 20, 1924

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 2 is located 300 Ft. from S line and 980 Ft. from E line

SW/4 Sec 14

27N

05E

Osage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1142 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings to be used. Indicate proposed mudding, cementing & other work.

Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.

Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.

A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk
 from hole if needed. RIH w/bit & scraper to TD. Set
 CIBP at end of casing or liner. Perf & cement csg or
 liner to 700' above end. WOC. Shoot off & POOH w/top
 500' of csg. (or shoot every 50 ft to surface). Install new
 3½" production casing w/bottom 500 ft chrome lined.
 Cement this to surface w/DV tool set @ 600'. WOC.
 RIH w/ bit & clean out to CIBP. Run CBL. Will drill
 CIBP & put on production when needed for CO2 flood.
 I understand that this plan of work must receive approval in
 writing of the Osage Indian Agency before operations
 may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. Spencer

Title: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

Conversion..... ☐Formation Treatment.. ☐Altering casing..... ☐Plugging Back..... ☐Plugging..... ☐**Details of Work & Results Obtained**

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Amt. Recovered	If Parted	
			Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010.

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Phillips Pet. Corp.

April 7, 1924

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 3 is located 2340 Ft. from N line and 1660 Ft. from E lineSW/4 Sec 1427N05EOsage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1155 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

- Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings to be used. Indicate proposed mudlogging, cementing & other work.
 Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.
 Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.
 A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk from hole if needed. RIH w/bit & scraper to TD. Set CIBP at end of casing or liner. Perf & cement csg or liner to 700' above end. WOC. Shoot off & POOH w/top 500' of csg. (or shoot every 50 ft to surface). Install new 3½" production casing w/bottom 500 ft chrome lined. Cement this to surface w/DV tool set @ 600'. WOC. RIH w/ bit & clean out to CIBP. Run CBL. Will drill CIBP & put on production when needed for CO2 flood. I understand that this plan of work must receive approval in writing of the Osage Indian Agency before operations may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. Spencer

Title: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

Conversion..... ☐Formation Treatment.. ☐Altering casing..... ☐Plugging Back..... ☐Plugging..... ☐**Details of Work & Results Obtained**

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Am't. Recovered	If Perforated Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

Phillips Pet. Corp.

North Burbank Unit Tract 31

April 7, 1924

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 4A is located 340 Ft. from S line and 300 Ft. from W line

SW/4 Sec 14

27N

05E

Osage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings to be used. Indicate proposed mudding, cementing & other work.

Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.

Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.

A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs
 To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk from hole if needed. RIH w/bit & scraper to TD. Set CIBP at end of casing or liner. Perf & cement csg or liner to 700' above end. WOC. Shoot off & POOH w/top 500' of csg. (or shoot every 50 ft to surface). Install new 3½" production casing w/bottom 500 ft chrome lined. Cement this to surface w/DV tool set @ 600'. WOC. RIH w/ bit & clean out to CIBP. Run CBL. Will drill CIBP & put on production when needed for CO2 flood. I understand that this plan of work must receive approval in writing of the Osage Indian Agency before operations may be commenced.

Lessee: Chaparral Energy, L.L.C.Signature: David P. SpencerTitle: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____
 Conversion..... ☐
 Formation Treatment.. ☐
 Altering casing..... ☐
 Plugging Back..... ☐
 Plugging..... ☐

Details of Work & Results Obtained

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Am't. Recovered	If Parted Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010.

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Phillips Pet. Corp.

April 7, 1924

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 6 is located 980 Ft. from N line and 300 Ft. from W line

SW/4 Sec 14

27N

05E

Osage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1181 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

- Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings to be used. Indicate proposed mudding, cementing & other work.
 Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.
 Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.
 A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk
 from hole if needed. RIH w/bit & scraper to TD. Set
 CIBP at end of casing or liner. Perf & cement csg or
 liner to 700' above end. WOC. Shoot off & POOH w/top
 500' of csg. (or shoot every 50 ft to surface). Install new
 3½" production casing w/bottom 500 ft chrome lined.
 Cement this to surface w/DV tool set @ 600'. WOC.
 RIH w/ bit & clean out to CIBP. Run CBL. Will drill
 CIBP & put on production when needed for CO2 flood.
 I understand that this plan of work must receive approval in
 writing of the Osage Indian Agency before operations
 may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. Spencer

Title: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

- Conversion..... ☐
 Formation Treatment.. ☐
 Altering casing..... ☐
 Plugging Back..... ☐
 Plugging..... ☐

Details of Work & Results Obtained

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Am't. Recovered	If Parted Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Gladys I. Chandler

May 20, 1924

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 11 is located 980 Ft. from N line and 300 Ft. from E line

SW/4 Sec 14

27N

05E

Osage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1137 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

- Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing.... ☒
 Formation Treatment.. ☐
 ☐

Details of Work*Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings**to be used. Indicate proposed mudlogging, cementing & other work.**Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.**Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.**A \$15.00 plugging fee is also required with each application to plug.*0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk
 from hole if needed. RIH w/bit & scraper to TD. Set
 CIBP at end of casing or liner. Perf & cement csg or
 liner to 700' above end. WOC. Shoot off & POOH w/top
 500' of csg. (or shoot every 50 ft to surface). Install new
 3½" production casing w/bottom 500 ft chrome lined.
 Cement this to surface w/DV tool set @ 600'. WOC.
 RIH w/ bit & clean out to CIBP. Run CBL. Will drill
 CIBP & put on production when needed for CO2 flood.
 I understand that this plan of work must receive approval in
 writing of the Osage Indian Agency before operations
 may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. Spencer

Title: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

Conversion..... ☐Formation Treatment.. ☐Altering casing..... ☐Plugging Back..... ☐Plugging..... ☐**Details of Work & Results Obtained**

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Ann. Recovered	If Panned	How
			Depth	

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010.

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 15 is located 980 Ft. from N line and 980 Ft. from W lineSW/4 Sec 1427N05EOsage County, Oklahoma

(1/4 Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1201 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work*Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings**to be used. Indicate proposed mudding, cementing & other work.**Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.**Plugging will not commence until 10 days following approval date unless authority granted for earlier commencement.**A \$15.00 plugging fee is also required with each application to plug.*0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk
 from hole if needed. RIH w/bit & scraper to TD. Set
 CIBP at end of casing or liner. Perf & cement csg or
 liner to 700' above end. WOC. Shoot off & POOH w/top
 500' of csg. (or shoot every 50 ft to surface). Install new
 3 1/2" production casing w/bottom 500 ft chrome lined.
 Cement this to surface w/DV tool set @ 600'. WOC.
 RIH w/ bit & clean out to CIBP. Run CBL. Will drill
 CIBP & put on production when needed for CO2 flood.
 I understand that this plan of work must receive approval in
 writing of the Osage Indian Agency before operations
 may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. SpencerTitle: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

Conversion..... ☐Formation Treatment.. ☐Altering casing..... ☐Plugging Back..... ☐Plugging..... ☐**Details of Work & Results Obtained**

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Amt. Recovered	If Parted	
			Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010.

United States
Department of the Interior
Osage Indian Agency
Pawhuska, Oklahoma

Date: April 12, 2010**Application For the Operation or Report on Wells**

North Burbank Unit Tract 31

Gladys I. Chandler

May 20, 2024

\$35.00

(Commencement money paid to whom)

(Date)

(Amount)

Well No.: 16 is located 980 Ft. from N line and 980 Ft. from E line

SW/4 Sec 14

27N

05E

Osage County, Oklahoma

(¼ Sec. & Sec. No.)

(Twp)

(Range)

The elevation of the ground level above sea level is 1158 Ft.**Use This Side to Request Authority for Work**

(Three Copies Required)

Notice of Intention To:

- Drill..... ☐
 Plug..... ☐
 Deepen or plug back.. ☐
 Convert..... ☐
 Pull or alter casing..... ☒
 Formation Treatment.. ☐
 ☐

Details of Work

Drilling applications will state proposed TD & horizons to be tested. Show size & length of casings

to be used. Indicate proposed mudlogging, cementing & other work.

Plugging applications shall set forth reasons for plugging & detailed statement of proposed work.

Plugging will not commence until 10 days following approval date unless authority granted for

earlier commencement.

A \$15.00 plugging fee is also required with each application to plug.

0 Bbls oil 0 Bbls water in 24 hrs

To reactivate & set up for production in CO2 test area
 Will MIRU POOH w/tbg, rods, & pump. Fish all junk
 from hole if needed. RIH w/bit & scraper to TD. Set
 CIBP at end of casing or liner. Perf & cement csg or
 liner to 700' above end. WOC. Shoot off & POOH w/top
 500' of csg. (or shoot every 50 ft to surface). Install new
 3½" production casing w/bottom 500 ft chrome lined.
 Cement this to surface w/DV tool set @ 600'. WOC.
 RIH w/ bit & clean out to CIBP. Run CBL. Drill out
 BP & put on production w/ceramic coated tbg & pump.
 I understand that this plan of work must receive approval in
 writing of the Osage Indian Agency before operations
 may be commenced.

Lessee: Chaparral Energy, L.L.C.

Signature: _____

David P. Spencer

Title: Manager of Regulatory AffairsAddress: 701 Cedar Lake Blvd., Oklahoma City, Oklahoma 73114**Use This Side To Report Completed Work**

(One Copy Required)

Character of Well (oil, gas or dry)

Subsequent Report of: _____

Conversion..... ☐Formation Treatment.. ☐Altering casing..... ☐Plugging Back..... ☐Plugging..... ☐**Details of Work & Results Obtained**

Work commenced: _____

Work completed: _____

(Continue on reverse if necessary)

This block for plugging information only**Casing Record**

Size	In Hole When Started	Am't Recovered	If Parted Depth	How

Original TD _____

Lessee: _____

By: _____

Subscribed and sworn to before me this _____ day of _____, 2010

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-1 Company Name Cosden Oil and Gas Co Date Drilled 5/23/1924 Depth 3100 '

Location 2340' FN L & 300' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 10/25/1946

Elevation 1123 ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	20 "	15 '			' Fill hole w/ hvy mud. Spot 25 sx cmt. Part and POOH w/ 2927' 5 1/2" csg; 2826' 7" csg; and 1046' 8 5/8" csg. Spot 10 sx @ 1025'. Filled hole w/ mud.
"	8 5/8 "	2331 '			
"	7 "	2823 '			
"	5 1/2 "	Liner '	2800' - 2990'		
"	"	'			
Formations Open To Wellbore:			None		

Well Name NBU 31-1A Company Name Mid-Continent Petroleum Date Drilled 8/21/1946 Depth 3093 '

Location 330' FS L & 330' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1146 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	160 '	Cmt w/70 sx reg cmt		
"	5 1/2 "	2998 '	Cmt w/100 sx reg. Squeezed holes @ 2020' - 2431' w/ 100 sx reg, 20% DD.	2248	
"	"	'			
"	"	'			

Formations Open To Wellbore: Burbank (Open Hole 2998' - 3093') PBTD @ 3090'

Well Name NBU 31-2 Company Name Cosden Oil and Gas Co Date Drilled 5/20/1924 Depth 3043 '

Location 300' FS L & 980' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1143 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	10 "	374 '			
"	8 5/8 "	2332 '			
"	7 "	2814 '			
"	5 1/2 "	Liner '	2758' - 2992'		
"	"	'			
"	"	'			

Formations Open To Wellbore: Burbank (Open Hole 2992' - 3043')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-3 Company Name Cosden Oil and Gas Cc Date Drilled 5/19/1924 Depth 3096 '

Location 2340' FN L & 1660' FE L, SW /4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1156 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	932 '		'	
"	10 "	1004 '		'	
"	5/8 "	2342 '		'	
"	7 "	2828 '		'	
"	5 1/2 "	3001 '		'	

Formations Open To Wellbore: Burbank (Open Hole 3001' - 3096')

Well Name NBU 31-4 Company Name Cosden Oil and Gas Cc Date Drilled 4/18/1924 Depth 3080 '

Location 300' FS L & 300' FW L, SW /4, Sec. 14, T 27 N, R 05 E Status Collapsed Wellbore

Elevation _____ ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	951 '		'	Unrecoverable collapse of wellbore; hole mudded to surf.
"	8 5/8 "	2358 '		'	
"	7 "	2860 '		'	
"	5 1/2 "	Liner	2840' - 3010'	'	
"	"	"	"	'	

Formations Open To Wellbore: None

Well Name NBU 31-4A Company Name Cosden Oil and Gas Cc Date Drilled 6/18/1924 Depth 3080 '

Location 340' FS L & 300' FW L, SW /4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1169 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	951 '		'	
"	8 5/8 "	2358 '		'	
"	7 "	2860 '		'	
"	5 1/2 "	Liner	2800' - 3010'	'	
"	"	"	"	'	
"	"	"	"	'	

Formations Open To Wellbore: Burbank (Open Hole 3010' - 3080')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-5 Company Name Cosden Oil and Gas Cc Date Drilled 6/18/1924 Depth 3120 '

Location 980' F S L & 300' F W L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 1/31/1962

Elevation 1200 ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	8 5/8 "	2395 '			Spot 45 sx cmt w/ 1300# Diacel "D" @ 3072'. WOC. TOC @ 3000'. Part and POOH w/ 2640' 5 1/2" csg. Part and POOH w/ 2629' 7" csg. Dmp 10 sx cmt @ 2500'. WOC. Part and POOH w/ 1843' 8 5/8" csg. Mudded hole to surf.
"	7 "	2902 '			
"	5 1/2 "	3055 '			
"	"	"			
"	"	"			
"	"	"			
Formations Open To Wellbore:			None		

Well Name NBU 31-6 Company Name Cosden Oil and Gas Cc Date Drilled 5/19/1924 Depth 3100 '

Location 980' F N L & 300' F W L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1181 ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	15 1/2 "	971 '		'	
"	10 "	1513 '	162' in hole	'	
"	8 5/8 "	2376 '		'	
"	7 "	2856 '		'	
"	- 5 /12 "	Liner '	2810' - 3037' (Ripped @ 2810')	'	

Well Name NBU 31-7 Company Name Cosden Oil and Gas Cc Date Drilled 5/18/1924 Depth 3076 '

Location 300' F N L & 300' F W L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 8/1/1962

Elevation _____ ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cèment</u>	<u>If well is TA or P&A Describe How:</u>
"	15 1/2 "	153 '			Spot 30 sx cmt 2/ 30% Diacel "D" @ 3042'. WOC. TOC @ 2500'. Fill hole w/ hvy mud. Part and POOH w/ 2386' 5 1/2" csg. Part and POOH w/ 2377' 7" csg. Spot 10 sx cmt @ 2370. WOC. Part and POOH w/ 1871' 8 5/8" csg. Mudded hole to surf.
"	10 "	768 '			
"	8 5/8 "	2350 '			
"	7 "	2884 '			
"	5 1/2 "	3034 '			
"					
Formations Open To Wellbore:			None		

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-8 Company Name Cosden Oil and Gas Co Date Drilled 5/23/1924 Depth 3115 '

Location 300' FN L & 980' FW L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 7/25/1962

Elevation 1198 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	970 '			Spot 30 sx cmt w/ 30% Diacel "D" @ 3082'. WOC. Fill hole w/ hvy mud. TOC @ 2594'. Part and POOH w/ 2463' 5 1/2" csg. Part and POOH w/ 2452' 7" csg. Dmp 10 sx cmt @ 2440'. WOC. Part and POOH w/ 1896' 8 5/8" csg. Mudded hole to surf.
"	10 "	1029 '			
"	8 5/8 "	2381 '			
"	7 "	2912 '			
"	5 1/2 "	3073 '			

Formations Open To Wellbore: None

Well Name NBU 31-9 Company Name Cosden Oil and Gas Co Date Drilled 6/3/1924 Depth 3071 '

Location 300' FN L & 980' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 8/2/1962

Elevation 1161 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	42 '			Spot 30 sx cmt w/ 30% Diacel "D" @ 3040'. WOC. TOC @ 2431'. Fill hole w/ hvy mud. Part and POOH w/ 2412' 5 1/2" csg. Part and POOH w/ 2405' 7" csg. Dmp 10 sx cmt @ 2400'. WOC. Part and POOH w/ 1572' 8 5/8" csg. Mud hole to surf.
"	15 1/2 "	823 '			
"	10 "	639 '			
"	8 5/8 "	2324 '			
"	7 "	2829 '			
"	5 1/2 "	3015 '			

Formations Open To Wellbore:

None

Well Name NBU 31-10 Company Name Cosden Oil and Gas Co Date Drilled 6/2/1924 Depth 3043 '

Location 2340' FS L & 300' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 7/25/1962

Elevation 1142 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	33 '			Spot 30 sx cmt w/ 30% Diacel "D" @ 3003'. WOC. TOC @ 2975'. Fill hole w/ hvy mud. Part and POOH w/ 2656' 5 1/2" csg. Part and POOH w/ 2638' 7" csg. Spot 10 sx cmt @ 2600'. WOC. Part and POOH w/ 1042' 8 5/8" csg. Mudded hole to surf.
"	8 5/8 "	2310 '			
"	7 "	2983 '			
"	5 1/2 "	2986 '			
"	"	"			
"	"	"			

Formations Open To Wellbore: None

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-11 Company Name Cosden Oil and Gas Cc Date Drilled 7/27/1924 Depth 3058 '

Location 980' F N L & 300' F E L, SW /4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1138 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	58 '		'	
"	7 "	2314 '		'	
"	5 1/2 "	2869 '		'	
"	"	"		'	
"	"	"		'	

Formations Open To Wellbore: Burbank (Open Hole 2869' - 3058)

Well Name NBU 31-12 Company Name Cosden Oil and Gas Cc Date Drilled 6/5/1924 Depth 3072 '

Location 980' F S L & 300' F E L, SW /4, Sec. 14, T 27 N, R 05 E Status P&A'd 2/1/1962

Elevation 1149 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	15 1/2 "	913 '			Fill hole w/ hvy mud. Spot 35 sx cmt @ 3025'. WOC. TOC @ 2625'. Part and POOH w/ 2530' 5 1/2" csg. Part and POOH w/ 2519' 7" csg. Spot 10 sx cmt @ 2540'. Part and POOH w/ 1680' 8 5/8" csg. Mudded hole to surf.
"	8 5/8 "	2330 '			
"	7 "	2876 '			
"	5 1/2 "	3005 '			
"	"	"			

Formations Open To Wellbore: None

Well Name NBU 31-13 Company Name Cosden Oil and Gas Cc Date Drilled 6/3/1924 Depth 3100 '

Location 980' F S L & 980' F E L, SW /4, Sec. 14, T 27 N, R 05 E Status P&A'd 3/16/1962

Elevation 1154 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	39 '			Fill hole w/ hvy mud. Spot 30 sx cmt 2 850# Diacel "D". WOC. TOC @ 2392'. Part and POOH w/ 2235' 5 1/2" csg. Part and POOH w/ 2233' 7" csg. Part and POOH w/ 2006' 8 5/8" csg. Part and POOH w/ 1380' 10 3/4" csg. Mudded hole to surf.
"	5 1/2 "	920 '			
"	10 "	1641 '			
"	8 5/8 "	2324 '			
"	7 "	2903 '			
"	5 1/2 "	3036 '			

Formations Open To Wellbore: None

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-14 Company Name Cosden Oil and Gas Cc Date Drilled 6/14/1924 Depth 3140 '

Location 980' F S L & 980' F W L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 2/6/1962

Elevation 1201 ☒ GL ☐ KB

<u>Hole Size</u>	<u>Casing Size</u>	<u>Landed Depth</u>	<u>Cement & Additive Data</u>	<u>Top of Cement</u>	<u>If well is TA or P&A Describe How:</u>
"	20 "	41 '	PBTD 3127'		Fill hole w/ hvy mud. Spot 55 sx cmt w/ 1500# Diacel "D" @ 3070'. WOC. TOC @ 2635'. Part and POOH w/ 2530' 5 1/2" csg. Part and POOH w/ 2518' 7" csg. Spot 10 sx cmt @ 2500'. WOC. Part and POOH w/ 1925' 8 5/8" csg. Mudded hole to surf.
"	15 1/2 "	611 '			
"	10 "	1683 '			
"	8 5/8 "	2374 '			
"	7 "	2920 '			
"	5 1/2 "				
Formations Open To Wellbore:			None		

Well Name NBU 31-15 Company Name Cosden Oil and Gas Cc Date Drilled 7/16/1924 Depth 3124 '

Location 980' F N L & 980' F W L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Shut In Oil

Elevation 1201 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '			
"	10 "	1039 '			
"	8 5/8 "	2337 '			
"	7 "	2909 '	Squeezed leaks @ 367', & 2228'-2391' w/650 sx reg		
"	5 1/2 "	3102 '	Part @ 2837'. From 2837' to 3079' in hole		

Formations Open To Wellbore: Burbank (Openhole 3102' - 3124')

Well Name NBU 31-16 Company Name Cosden Oil and Gas Cc Date Drilled 6/10/1924 Depth 3062 '

Location 980' F N L & 980' F E L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Oil Producer

Elevation 1159 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	20 "	20 '			
"	8 5/8 "	2331 '			
"	7 "	2882 '			
"	5 1/2 "	3027 '	Part @ 2823'. 2823' - 3003' in hole		
"	"	"			
"	"	"			

Formations Open To Wellbore: Burbank (Open Hole 3027' - 3062')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-W21 Company Name Phillips Petroleum Com Date Drilled 8/26/1961 Depth 3137 '

Location 890' FS L & 565' FW L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 6/1/1992

Elevation 1200 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	118 '	115 sx	surf	' Spot 30 sx cmt for btm plug@ @ 2750'. Load hole w/ gel. Spot 55 sx cmt from 1153'. WOC. Shot off 360' 4 1/2" csg. Circ cmt from 312' to surf. Cut off 8 5/8" csg 3' below GL. Restore Loc.
"	4 1/2 "	3085 '	134 sx w/ 3750# Diacel "D"		
"	"	"			
"	"	"			
"	"	"			

Formations Open To Wellbore: None

Well Name NBU 31-W23 Company Name Phillips Petroleum Co. Date Drilled 8/21/1961 Depth 3090 '

Location 890' FS L & 715' FE L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Injection Well

Elevation 1146 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	113 '	Cmt w/115 sx	surf	
"	4 1/2 "	3048 '	114 sx w/ 30% Diacel "D". Cmt w/380 sx reg, between 4 1/2" & 8 5/8" csg	1800	
"	3 1/2 "	3015 '	Cmt w/200 sx Reg, 2% Gel. Squeeze leaks w/375 sx Reg cmt		
"	"	"			
"	"	"			

Formations Open To Wellbore: Burbank (Open Hole 3048' - 3090')

Well Name NBU 31-W25 Company Name Phillips Petroleum Com Date Drilled 3/29/1962 Depth 3118 '

Location 420' FN L & 565' FW L, SW 1/4, Sec. 14, T 27 N, R 05 E Status Injection Well

Elevation 1169 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	111 '	105 sx	surf	
"	4 1/2 "	3080 '	190 sx w/ 30% Diacel "D"	1725	
"	"	"	sqz csg lk w/ 125 sx reg cmt. sqz csg lk from 344' to surf. Pmp 50 sx cmt to circ.		
"	"	"	WOC. Pmp 25 sx reg cmt Circ hole 2/ 40 bbl gelled water. Pmp 150 sx cmt w/ 4% gel. WOC. Back on injection.		
"	"	"			

Formations Open To Wellbore: Burbank (Open Hole 3080' - 3118')

OSAGE TABULATION OF WELLS WITHIN 1/4 MILE OF PROPOSED INJECTION WELL
WHICH PENETRATE THE INJECTION ZONE

Proposed Inj Well _____

Well Name NBU 31-W27 Company Name Phillips Petroleum Com Date Drilled 4/3/1962 Depth 3081 '

Location 420' F N L & 715' F E L, SW 1/4, Sec. 14, T 27 N, R 05 E Status P&A'd 10/7/1972

Elevation 1146 ☒ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	8 5/8 "	124 '	115 sx	surf	Irreperable csg dmg @ 1023'. Filled hole w/ hvy mud. Pmp 100 sx rdy mix cmt @ 1050'. WOC. Pmp 10 sx cmt @ 160'. WOC. Pmp 15 sx cmt down annulus and displaced w/ 3 bbls mud.
"	4 1/2 "	3040 '	80 sx w/ 30% DD 70 sx w/ 40% DD		
"	"	"			
"	"	"			
"	"	"			

Formations Open To Wellbore: None

Well Name _____ Company Name _____ Date Drilled _____ Depth _____ '

Location _____ ' F _____ L & _____ ' F _____ L, _____ /4, Sec. _____, T _____ N, R _____ E Status _____

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	"	"		"	
"	"	"		"	
"	"	"		"	
"	"	"		"	
"	"	"		"	

Formations Open To Wellbore: _____

Well Name _____ Company Name _____ Date Drilled _____ Depth _____ '

Location _____ ' F _____ L & _____ ' F _____ L, _____ /4, Sec. _____, T _____ N, R _____ E Status _____

Elevation _____ ☐ GL ☐ KB

Hole Size	Casing Size	Landed Depth	Cement & Additive Data	Top of Cement	If well is TA or P&A Describe How:
"	"	"		"	
"	"	"		"	
"	"	"		"	
"	"	"		"	
"	"	"		"	

Formations Open To Wellbore: _____

● CORE ANALYSIS

● WATER REPRESSURE

ENGINEERING

● WATER ANALYSIS

● CODING WATER TREATMENT

● SURVEYING

OILFIELD RESEARCH LABORATORIES

REGISTERED ENGINEERS

700 NORTH MISSION
OKMULGEE, OKLAHOMA
PHONE: 4444

Chanute, Kansas

536 N. HIGHLAND
CHANUTE, KANSAS
PHONE: HE 1-2630

September 2, 1961

Phillips Petroleum Company
Production Department
Bartlesville, Oklahoma

Gentlemen:

Enclosed herewith are the results of permeability and porosity tests run on the Rotary core taken from the North Burbank Unit, Well No. 31-W-23, Osage County, Oklahoma, and submitted to our laboratory on August 30, 1961.

This core was taken and shipped to our laboratory by a representative of the Phillips Petroleum Company.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Carl L. Pate
Carl L. Pate

CLP:rf

1 c. - S.I. Betzer



Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Phillips Petroleum Co. Lease N.B.U. Well No. 31-W-23

Location SW $\frac{1}{4}$

Section 14 Twp. 27N Rge. 5E County Osage State Oklahoma

Name of Sand - - - - - Burbank

Top of Core - - - - - 3038.0

Bottom of Core - - - - - 3086.0

Top of Sand - - - - - ?

Bottom of Sand - - - - - ?

Total Feet of Permeable Sand - - - - - 27.8

Total Feet of Floodable Sand - - - - - -

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 10	11.0	11.0
10 - 50	9.6	20.6
50 - 100	1.0	21.6
100 - 300	4.0	25.6
300 & above	2.2	27.8

Average Permeability Millidarcys - - - - - 80.0

Average Percent Porosity - - - - - 17.9

Average Percent Oil Saturation - - - - -

Average Percent Water Saturation - - - - -

Average Oil Content, Bbls./A. Ft. - - - - -

Total Oil Content, Bbls./Acre - - - - -

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - -

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -

Total Calculated Oil Recovery, Bbls./Acre - - - - -

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

OILFIELD RESEARCH LABORATORIES

LOGCompany Phillips Petroleum Co. Lease N.B.U. Well No. 31-W-23

<u>Depth Interval,</u> <u>Feet</u>	<u>Description</u>
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3038.0 - 3040.0	- Brown sandstone.
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3040.0 - 3044.2	- Soft brown sandstone.
-----------------	-------------------------

3044.2 - 3044.4	- Shale.
-----------------	----------

3044.4 - 3051.0	- Soft brown sandstone.
-----------------	-------------------------

3051.0 - 3063.0	- Brown sandstone.
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3063.0 - 3086.0	- Dark carbonaceous sandstone containing a vertical fracture.
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Oilfield Research Laboratories
RESULTS OF PERMEABILITY AND POROSITY TESTS
TABLE I A

Company Phillips Petroleum Co. Lease N.B.U. Well No. 31-W-23

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.	Percent Porosity
			Ft.	Cum. Ft.		
1	3038.5	5.1	1.0	1.0	5.10	17.5
2	3039.5	21.	1.0	2.0	21.00	15.4
3	3040.5	186.	1.0	3.0	186.00	22.6
4	3041.5	81.	1.0	4.0	81.00	20.6
5	3042.5	260.	1.0	5.0	260.00	24.8
6	3043.5	510.	1.2	6.2	612.00	26.8
7	3044.5	43.	0.6	6.8	25.80	18.1
8	3045.5	396.	1.0	7.8	396.00	26.4
9	3046.5	29.	1.0	8.8	29.00	21.0
10	3047.5	260.	1.0	9.8	260.00	25.4
11	3048.5	143.	1.0	10.8	143.00	23.6
12	3049.5	49.	1.0	11.8	49.00	21.2
13	3050.5	34.	1.0	12.8	34.00	19.6
14	3051.5	12.	1.0	13.8	12.00	17.5
15	3052.5	11.	1.0	14.8	11.00	16.0
16	3053.5	4.8	1.0	15.8	4.80	14.9
17	3054.5	9.1	1.0	16.8	9.10	14.9
18	3055.5	13.	1.0	17.8	13.00	16.1
19	3056.5	44.	1.0	18.8	44.00	17.5
20	3057.5	3.3	1.0	19.8	3.30	11.5
21	3058.5	12.	1.0	20.8	12.00	16.2
22	3059.5	7.9	1.0	21.8	7.90	14.7
23	3060.5	6.7	1.0	22.8	6.70	14.2
24	3061.5	6.9	1.0	23.8	6.90	15.6
25	3062.5	4.8	1.0	24.8	4.80	13.9
26	3063.5	Imp.	1.0	25.8	0.00	-
27	3064.5	Imp.	1.0	26.8	0.00	-
28	3065.5	Imp.	1.0	27.8	0.00	-
29	3066.5	Imp.	1.0	28.8	0.00	-
30	3067.5	Imp.	1.0	29.8	0.00	-
31	3068.5	Imp.	1.0	30.8	0.00	-
32	3069.5	Imp.	1.0	31.8	0.00	-
33	3070.5	Imp.	1.0	32.8	0.00	-
34	3071.5	Imp.	1.0	33.8	0.00	-
35	3072.5	Imp.	1.0	34.8	0.00	-
36	3073.5	Imp.	1.0	35.8	0.00	-
37	3074.5	0.43	1.0	36.8	0.43	10.5
38	3075.5	Imp.	1.0	37.8	0.00	-
39	3076.5	Imp.	1.0	38.8	0.00	-
40	3077.5	Imp.	1.0	39.8	0.00	-

Oilfield Research Laboratories
RESULTS OF PERMEABILITY AND POROSITY TESTS
TABLE I A

Company Phillips Petroleum Co. Lease N.B.U. Well No. 31-W-23

Sample No.	Depth, Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.	Percent Porosity
			Ft.	Cum. Ft.		
41	3078.5	Imp.	1.0	40.8	0.00	~
42	3079.5	0.25	1.0	41.8	0.25	12.5
43	3080.5	Imp.	1.0	42.8	0.00	-
44	3081.5	Imp.	1.0	43.8	0.00	~
45	3082.5	0.25	1.0	44.8	0.25	11.8
46	3083.5	Imp.	1.0	45.8	0.00	~
47	3084.5	Imp.	1.0	46.8	0.00	~
48	3085.5	Imp.	1.0	47.8	0.00	-

Oilfield Research Laboratories

SUMMARY OF PERMEABILITY & POROSITY TESTS

TABLE II A

Company	Phillips Petroleum Co.	Lease	N.B.U.	Well No.	31-W-23
Depth Interval, Feet	Feet of Core Analyzed	Average Air Permeability, Millidarcys	Average Effective Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Porosity
3038.0 - 3063.0	24.8	90.	-	2237.40	18.7
3074.0 - 3083.0	3.0	0.31	-	0.93	11.6
3038.0 - 3063.0	27.8	80.	-	2238.33	17.9

● CORE ANALYSIS

● WATER REPRESSURING ENGINEERING

● WATER ANALYSIS

● FLO. & W. TREATMENT

● SURVEYING

OILFIELD RESEARCH LABORATORIES

- REGISTERED ENGINEERS -

700 NORTH MISSION
OKMULGEE, OKLAHOMA
PHONE: 4444

Chanute, Kansas

536 N. HIGHLAND
CHANUTE, KANSAS
PHONE: HE 1-2650

October 25, 1962 ✓

23-W-23

Phillips Petroleum Company
Production Department
Bartlesville, Oklahoma

Gentlemen:

Enclosed herewith are the results of permeability and porosity tests run on the Rotary core taken from the North Burbank Unit, Well No. 23W-23, Osage County, Oklahoma, and submitted to our laboratory on October 19, 1962.

This core was taken and shipped to our laboratory by a representative of the Phillips Petroleum Company.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Fred O. Stenger
Fred O. Stenger

FOS:rf

15 c. - Bartlesville, Okla.
1 c. - Shidler, Okla.

10/25/62
[Signature]

RFM
RBD

M. Lin

Oilfield Research Laboratories

GENERAL INFORMATION & SUMMARY

Company Phillips Petroleum Co. Lease N.B.U. Well No. 23W-23

Location NW¹/₄

Section 14 Twp. 27N Rge. 5E County Osage State Oklahoma

Name of Sand - - - - - Burbank

Top of Core - - - - - 3039.0

Bottom of Core - - - - - 3087.0

Top of Sand - - - - - (Received) - - - - - 3039.1

Bottom of ^{Good}Sand - - - - - 3077.0

Total Feet of Permeable Sand - - - (Analyzed) - - - - - 38.9

Total Feet of Floodable Sand - - - - - -

Distribution of Permeable Sand:
Permeability Range
Millidarcys

Feet

Cum. Ft.

0 - 10	8.4	8.4
10 - 100	22.3	30.7
100 - 400	4.0	4.7
400 & above	4.2	38.9

Average Permeability Millidarcys - - - - - 128.5

Average Percent Porosity - - - - - 18.5

Average Percent Oil Saturation - - - - -

Average Percent Water Saturation - - - - -

Average Oil Content, Bbls./A. Ft. - - - - -

Total Oil Content, Bbls./Acre - - - - -

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - -

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -

Total Calculated Oil Recovery, Bbls./Acre - - - - -

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

-LOG-

Company Phillips Petroleum Co. Lease N.B.U. Well No. 23W-23

<u>Depth Interval,</u> <u>Feet</u>	<u>Description</u>
---------------------------------------	--------------------

3039.0 - 3039.1 - Sandy shale.

3039.1 - 3039.9 - Brown sandstone.

3039.9 - 3040.0 - Sandy shale.

3040.0 - 3040.6 - Brown shaly sandstone.

3040.6 - 3040.8 - Sandy shale.

3040.8 - 3047.2 - Brown sandstone.

3047.2 - 3047.3 - Sandy shale.

3047.3 - 3066.2 - Brown sandstone containing a vertical fracture.

3066.2 - 3066.8 - Loss.

3066.8 - 3077.0 - Brown sandstone.

3077.0 - 3087.0 - Dark carbonaceous sandstone containing a vertical fracture.

Oilfield Research Laboratories
RESULTS OF PERMEABILITY AND POROSITY TESTS
TABLE I A

Company Phillips Petroleum Co. Lease N.B.U. Well No. 23W-23

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.	Percent Porosity
			Ft.	Cum. Ft.		
1	3039.5	53.	0.8	0.8	42.40	20.9
2	3040.5	0.57	0.6	1.4	0.34	10.6
3	3041.5	1560.	1.2	2.6	1872.00	28.4
4	3042.5	440.	1.0	3.6	440.00	25.8
5	3043.5	122.	1.0	4.6	122.00	22.8
6	3044.5	140.	1.0	5.6	140.00	23.8
7	3045.5	485.	1.0	6.6	485.00	27.1
8	3046.5	24.	1.2	7.8	28.80	21.4
9	3047.5	57.	0.7	8.5	39.90	21.5
10	3048.5	200.	1.0	9.5	200.00	26.5
11	3049.5	68.	1.0	10.5	68.00	23.8
12	3050.5	485.	1.0	11.5	485.00	27.5
13	3051.5	367.	1.0	12.5	367.00	27.2
14	3052.5	93.	1.0	13.5	93.00	23.0
15	3053.5	81.	1.0	14.5	81.00	21.6
16	3054.5	56.	1.0	15.5	56.00	19.8
17	3055.5	90.	1.0	16.5	90.00	20.4
18	3056.5	32.	1.0	17.5	32.00	17.3
19	3057.5	39.	1.0	18.5	39.00	17.4
20	3058.5	13.	1.0	19.5	13.00	15.7
21	3059.5	25.	1.0	20.5	25.00	16.6
22	3060.5	17.	1.0	21.5	17.00	16.5
23	3061.5	5.8	1.0	22.5	5.80	14.8
24	3062.5	0.87	1.0	23.5	0.87	10.1
25	3063.5	23.	1.0	24.5	23.00	16.4
26	3064.5	19.	1.0	25.5	15.20	15.8
27	3065.5	5.2	0.8	26.3	2.08	14.0
28	3066.1	12.	0.4	26.7	14.40	14.4
29	3067.5	10.	1.2	27.9	10.00	12.6
30	3068.5	23.	1.0	28.9	23.00	14.7
31	3069.5	4.5	1.0	29.9	4.50	14.1
32	3070.5	29.	1.0	30.9	29.00	15.0
33	3071.5	24.	1.0	31.9	24.00	16.8
34	3072.5	34.	1.0	32.9	34.00	16.5
35	3073.5	44.	1.0	33.9	44.00	17.4
36	3074.5	6.5	1.0	34.9	6.50	13.7
37	3075.5	27.	1.0	35.9	27.00	16.4
38	3076.5	6.5	1.0	36.9	6.50	13.2
39	3077.5	Imp.	1.0	37.9	0.00	-
40	3078.5	0.39	1.0	38.9	0.39	9.7
41	3079.5	Imp.	1.0	39.9	0.00	-
42	3080.5	0.30	1.0	40.9	0.30	11.7
43	3081.5	Imp.	1.0	41.9	0.00	-
44	3082.5	Imp.	1.0	42.9	0.00	-

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RESULTS OF PERMEABILITY AND POROSITY TESTS
TABLE I A

Company Phillips Petroleum Co. Lease N.B.U. Well No. 23W-23

Sample No.	Depth Feet	Permeability Millidarcys	Feet of Core		Permeability Capacity Ft. x Md.	Percent Porosity
			Ft.	Cum. Ft.		
45	3083.5	Imp.	1.0	43.9	0.00	-
46	3084.5	Imp.	1.0	44.9	0.00	-
47	3085.5	Imp.	1.0	45.9	0.00	-
48	3086.5	Imp.	1.0	46.9	0.00	-

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SUMMARY OF PERMEABILITY & POROSITY TESTS

TABLE II A

Company	Phillips Petroleum Co.	Lease	N.B.U.	Well No.	23W-23
Depth Interval, Feet	Feet of Core Analyzed	Average Air Permeability, Millidarcys	Average Effective Permeability, Millidarcys	Permeability Capacity Ft. x Md.	Average Percent Porosity
3039.1 - 3056.0	16.5	379.5	-	4610.44	23.5
3056.0 - 3081.0	22.4	17.7	-	396.54	14.8
3039.1 - 3081.0	38.9	128.5	-	5006.98	18.5